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Name of Registered Representative:

John R. Lagowski, Registration No. 41,922

August 17, 2007

Date of Signature

PATENT

Attorney Docket No. MP0973 (13036/14)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Mark Melvin Butterworth)

Serial No.: 10/092,772)

Filed: March 7, 2002)

For: METHOD AND APPARATUS FOR)
PERFORMING OPTICAL CHARACTER)
RECOGNITION (OCR) AND TEXT)
STITCHING)

Examiner: Sath V. Perungavoor

Group Art Unit: 2624

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant requests review of the final rejection in the above-identified application.
No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reasons stated on the attached sheets. No more than five
(5) pages are provided.

I. OVERVIEW

Claims 1, 4-7, 9-13, and 15-17 are currently pending. All of the claims have been finally rejected under 35 U.S.C. § 102(b) and 102(e) as anticipated by Sakai et al. (USPN 7,194,144) or under 35 U.S.C. § 103(a) as unpatentable over Sakai et al. in view of Nakao (USPN 6,459,819). Applicant asserts that the Examiner has incorrectly interpreted the Sakai et al. reference in support of the rejections.

In summary, Sakai et al. does not at least disclose a method or apparatus that receives direction information indicative of the direction of movement of a camera while capturing images of a document. As explained below, much of the Sakai et al. disclosure concerns an assumed direction of camera movement, and then making predetermined adjustments if that assumption turns out to be wrong. If the camera's direction of movement was in fact known, the Sakai et al. disclosure would not make sense because there would be no reason for Sakai et al. to disclose making the predetermined adjustments. Finally, the "reading direction" that the Examiner asserts is a "scanning direction" in Sakai et al. is in fact the direction of words on a page as is demonstrated by the figures of the Sakai et al. patent (e.g., reading direction left-to-right (English) or reading direction top-to-bottom (traditional Chinese)).

II. DETAILED RESPONSE TO THE EXAMINER'S REJECTIONS

Claim 1:

Claim 1 was rejected under 35 U.S.C. § 102(b) and 102(e) as anticipated by Sakai et al.

Claim 1 includes the following limitation:

receiving direction information indicative of a direction of relative movement between the image capture device and the document during the capture of the plurality of partially overlapping digital images.

The Office Action states that this limitation is disclosed in Sakai et al. at Figure 32; col. 10, ll. 1-50; col. 24, ll. 1-5. The Office Action also states that the "reading direction" referred to at col. 24, l. 2 is the same as the direction information recited in Claim 1. Applicant respectfully disagrees and submits that the limitation noted above is not disclosed or suggested in Sakai et al.

As explained below, the “reading direction” in Sakai et al. does not refer to camera movement or capture direction, but rather refers to the direction of text on a page. For example, English text is printed from left to right across horizontal lines on a page (the reading direction is left to right), while traditional Chinese text is printed top to bottom along vertical lines on a page (the reading direction is top to bottom). Sakai et al. contrasts these reading directions to one another in Figs. 8A and 8B, 10A and 10B, and 14A and 14B. As explained below, Sakai et al. utilizes information about the reading direction to simplify the process of finding overlapping regions of text among a plurality of captured images. Sakai et al. does not disclose inputting the moving direction of the camera or detecting the moving direction of the camera.

Sakai et al. discusses at length detecting the direction of text on a page and using that information to merge images together. For example, Sakai et al. provides “[i]nitially, a line direction in a document image is identified (step S401 of FIG. 4).” col. 7, ll. 11-12. In Sakai et al., the line direction is determined by detecting the direction of highest concentration of black pixels on a page. If the concentration is higher in the vertical direction than in the horizontal direction, then the text is oriented in the vertical direction (e.g., traditional Chinese text). If the concentration is higher in the horizontal direction than in the vertical direction, then the text is oriented in the horizontal direction. Sakai et al. then explains how the text direction is used:

In this process, if a document is horizontally written, the direction where the document images stored in the first and the second image storing units 12 and 13 are read sequentially from the top to the bottom in pixel lines in a horizontal direction, is selected. If the document is vertically written, the direction where the document images are read sequentially from the right to the left in pixel lines in a vertical direction, is selected. col. 7, ll. 50-57

From the above passage, it can be understood that the images are first captured and stored, and then the text direction is determined. Next, Sakai et al. explains that comparison directions (whether to compare the bottom of one image to the top of another, or to compare the right side of one image to the left side of another) are selected based on the text direction and the “tendency” to capture images in a certain direction based on the text direction. For example, if the document has horizontal text, then the tendency would be to first capture a top image and then a bottom image that partially overlaps the top image. However, if the document has vertical

text, then the tendency would be to first capture a left image and then a right image that partially overlaps the left image. Sakai et al., col. 20, line 50 *et seq.*

The tendencies are not absolute. Instead, priorities are assigned based on the tendencies. If a document has horizontal text, then a top priority is given to the assumption that a top portion of an image is first captured and then the bottom portion. However, if a comparison attempt fails under this assumption, a second priority is assumed. The second priority assumes that the bottom portion of an image was captured first and then the top portion. This process of assuming, but not knowing, camera direction is discussed through cols. 9 and 10 of Sakai et al. Sakai et al. makes no reference to receiving direction information indicative of an actual direction of relative movement between the image capture device and the document.

The process of merging images using the analysis discussed above is further discussed at col. 11, ll. 26-42; col. 15, line 12 *et seq.*; col. 20, line 50 *et seq.* At col. 13, ll. 39-47, Sakai et al. states:

. . . if no matching line image exists as a result of the comparison made between all the line images in the first document image and the first line image in the second document image, it is determined that the document **scanning direction** is different, namely, it is determined that the upper half of the document is not firstly scanned and its lower half is not secondly scanned. Accordingly, the line images are compared in the comparison direction with the second highest priority. (bold added)

Here, as throughout the specification, Sakai et al. refers to *camera movement* as a “*scanning direction*” (not a “*reading direction*”). See also col. 7, line 21, *et seq.* and col. 10, line 2. The reading direction referred to at col. 24, l. 2 pertains to providing the text direction to the device so that it does not have to be detected by analyzing black pixels, thereby simplifying part of the process of merging sections. Sakai et al. does not disclose receiving actual direction information as recited in claim 1. Also, Sakai et al. does not suggest or teach modifying any of the disclosed embodiments for receiving direction information.

The Examiner cites col. 10, lines 1 and 2 of Sakai et al., which states that “the merging direction of document images is determined according to their scanning direction and order.” This statement should not be taken out of context, but rather should be interpreted based on the discussion above. It does not state that the scanning direction is in fact known or detected. Sakai et al. then discusses at col. 10 a number of merging scenarios, but does not disclose that the

scanning direction is known. In fact, Sakai et al. goes on to discuss a process for detecting an overlapping portion in step S407 of FIG. 4. Col. 10, line 52. This process is discussed throughout cols. 11-16. The process includes following the priority assumptions discussed *supra*. Of course, if the camera movement direction were known there would be no reason to make assumptions of the direction of camera movement. Thus, it is clear that although Sakai et al. explains that document images are merged depending on scanning direction, the scanning direction is not known, but only assumed. Sakai et al. does not disclose receiving direction information indicative of a direction of relative movement between the image capture device and the document during the capture of the plurality of partially overlapping digital images, as claimed. Sakai et al. specifically and thoroughly discusses a process of making assumptions, assigning priorities, and making adjustments for combining document images.

For at least the reasons stated above, Sakai et al. does not anticipate or render obvious claim 1. It is respectfully submitted that claim 1 is patentable over the cited references and the rejection should be withdrawn. Similarly, claims that are dependent on claim 1 are also patentable over the cited references for at least the same reasons as claim 1.

Claims 7 and 12:


Independent claims 7 and 12 in the present application, also rejected under 35 U.S.C. § 102(b) and 102(e) in view of Sakai et al., include limitations that are similar to the limitation discussed above. Accordingly, claims 7 and 12 and their respective dependent claims are believed to be patentable over the cited references for at least the same reasons as claim 1.

Conclusion

Accordingly, we respectfully assert that the rejections to the pending claims are based upon a clearly erroneous analysis of Sakai et al. We request that these errors be reviewed, the rejections withdrawn, and the claims allowed.

BRINKS HOFER GILSON & LIONE
P.O. Box 10395
Chicago, Illinois 60610

Respectfully submitted,



John R. Lagowski
Registration No. 41,922
Attorney for Applicants